DOCUMENT RESUME

ED 259 841 PS 015 194

TITLE	Expanding Human Services Training through Telecommunications: A Day Care-Head Start Study. Executive Summary.
INSTITUTION	North Carolina State Dept. of Human Resources, Raleigh. Office of Day Care Services.
SPONS AGENCY	Office of Human Development Services (DHHS), Washington, D.C.
PUB DATE	Jan 85
GRANT	90-PD-860021/01
NOTE	19p.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Comparative Analysis; *Cost Effectiveness; *Day Care Centers; Early Childhood Education; Postsecondary Education; *Staff Development; State Programs; *Telecommunications
IDENTIFIERS	*Instructional Effectiveness; Media Appraisal; North Carolina; *Project Head Start

ABSTRACT

The feasibility of incorporating teletraining into a statewide staff development program was examined in a comparison of four training approaches: traditional instruction and audio instruction enhanced with either slides, videocassettes, or slowscan. The training population consisted of directors and caregivers from Head Start and state-subsidized day care centers in North Carolina. Three urban and one rural teleconferencing centers were established in the state. Attendance at each site ranged from 7 to 18 teachers and aides and from 3 to 14 administrators. Lasting between 3 and 4 hours per subject area, training focused on the classroom environment, families, and financial management. It was found that teleconferencing can create a learning environment as desirable as the one created by traditional training, both in terms of amount of learning and attitudes toward training. Of the approaches examined, audioconferencing provided the most cost-effective alternative to traditional training. It was suggested that the other approaches can offer a number of benefits when used in a specialized manner. (RH)

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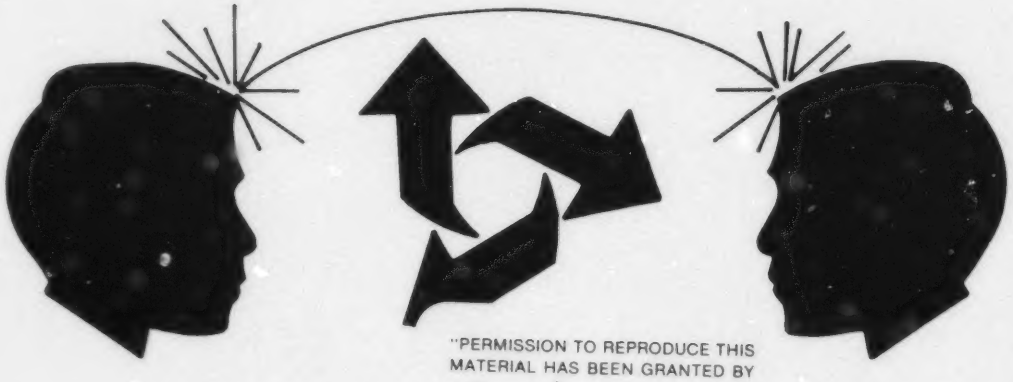
Expanding Human Services Training Through Telecommunications: A Day Care-Head Start Study

EXECUTIVE SUMMARY



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Telecommunications Project
Office of Day Care Services
North Carolina Department of Human Resources

Office of Human Development Services
Grant No. 90-PD-860021/01

Expanding Human Services Training Through Telecommunications: A Day Care-Head Start Study

Published in 1985
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North Carolina Department of
Human Resources
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Executive Summary

Acknowledgements

We received assistance and encouragement from many people as we developed our model for using teleconferencing for training. Allen Smith, our federal project officer, deserves special recognition for assisting us in designing the research, implementing the study, and reporting the results.

Madeline Dowling, of the Office of Program Development in Washington, D.C., often went beyond the call of duty by helping us keep a national perspective and by putting us in touch with the right resources at the right time.

Two national consultants, Virginia A. Ostendorf, President of Virginia A. Ostendorf, Inc., Littleton, Colorado, and Lorne Parker, Director of the Center for Interactive Programs at the University of Wisconsin, provided professional guidance throughout several phases of the project.

The Frank Porter Graham Child Development Center at the University of North Carolina — Chapel Hill conducted the external evaluation of our training sessions. Tanya Suarez and Richard Clifford provided valuable leadership during the evaluation. The entire team from Frank Porter Graham provided feedback that we used in refining our model.

Our technical services were provided by the North Carolina Agency for Public Telecommunications (APT). The staff of APT helped us become comfortable with teleconferencing equipment.

Our thanks to all of you!

Telecommunications Project

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Funding for the Telecommunications Project was made possible by a grant from the Office of Human Development Services, Administration for Children, Youth, and Families (ACYF), and the Office of Program Development (Grant No. 90-PD-860021/01).

The views are those of the authors and do not necessarily reflect the official position of the Office of Human Development Services or the U.S. Department of Health and Human Services.

The Telecommunications Project requests that any material abstracted from this executive summary be appropriately referenced as a matter of professional courtesy.

January 1985

Introduction

The Office of Day Care Services (ODCS) in the North Carolina Department of Human Resources has, as one of its major responsibilities, a statewide training program for Day Care personnel. To expand its resources for training, ODCS sought and received a federal grant to explore the use of telecommunications for training.

During an 18-month period, the Telecommunications Project developed and successfully completed three series of training programs in four North Carolina locations. In order to determine the effectiveness of this training, an intensive research study was conducted. The study demonstrated that telecommunications can be used effectively in human services training programs without sacrificing learning.

This was the first documented study of its kind to explore the use of teleconferencing for human services training. The findings, however, did support those of earlier studies conducted in business, industry, and education. A growing interest in teleconferencing is evident in all of these groups and predictions are that teleconferencing will soon become a widely accepted method of training.

Our Project has received a number of inquiries about the use of teleconferencing for training. In response to those inquiries and as a fulfillment of our agreement with our funding agencies, we have prepared this executive summary. The full report, *Expanding Human Services Training Through Telecommunications: A Day Care-Head Start Study,* has been submitted to our federal funding agencies.

In order to use teleconferencing for training, human services agencies first need to know whether it can effectively be used to increase the knowledge of its staff, the perceptions trainees have of teletraining, and its cost. These findings from our research are presented first; in the conclusions section, the benefits of teleconferencing are presented and recommendations are offered to help human services agencies make a meaningful and efficient application of teleconferencing in their training systems.

Our Project has also developed several other products which can help human services agencies interested in using teleconferencing for training:

- *Teleconferencing: A New Approach to Training for Human Services Agencies* which is a user's guide that discusses the benefits of teleconferencing and administrative issues. An overview of basic teleconferencing systems and guidelines for planning, conducting, and evaluating a teleconference is presented.
- *Telecommunications: Exploring New Horizons in Human Services Training* is a slide-tape program which describes the findings of our research. This program has been designed for use in the promotion of teleconferencing for administrators and other decision-making groups.
- Comprehensive training package for teleconference users.
- Three examples of curricula adapted to teleconferencing delivery methods.

In addition to the above teleconferencing products, the Project has also developed three examples of curricula adapted to computer assisted instruction.

We hope that this executive summary will stimulate your interest in the use of teleconferencing for training so that your agency can experience the benefits of these exciting new training delivery systems.

Expanding Human Services Training Through Telecommunications: A Day Care-Head Start Study
EXECUTIVE SUMMARY

Abstract of Findings

The Day Care-Head Start Telecommunications Training Study examined the feasibility of using teleconferencing to provide in-service training to child care workers. The study found that using teleconferencing can create a learning environment as desirable as the one created by traditional, face-to-face training, both in terms of amount of learning and attitudes toward training. The cost of teleconferencing, however, may vary greatly, depending upon equipment, training approach, use patterns, agency motivation, training facilities, and number of sites. Of the approaches examined, audioconferencing provided the most cost effective alternative to traditional training. The other teleconferencing approaches, though not as cost effective on a small scale, offer a number of benefits when used in a more specialized manner.

Background

Budget cuts have compelled many government agencies to streamline programs and administrative services. Such measures have often been taken in the areas of training and technical assistance, where travel costs consume an inordinate amount of resources.

To cope with these cutbacks, a number of universities, state agencies, and non-profit institutions have turned to the use of electronic systems to deliver training which, heretofore, has been delivered in person. Of these, audio teleconferencing predominates. In a survey of business firms, colleges, and government agencies (Olgren and Parker, 1983), it was reported that 57% of those using teleconferencing systems relied solely on audioconferencing with visual enhancements. Approximately 16% have supplemented these systems with slowscan television. Teleconference training and education have proliferated in universities (most notably in the Universities of Washington and Wisconsin), state agencies (e.g., Iowa Bureau of Social Services), and national agencies (e.g., Canada Department of Communications).

In addition, impressive savings on annual expenditures for business travel have been reported in many studies. Walt Sonneville (1980) reported five years ago: "Teleconferencing offers the prospect of saving 30% of our national annual expenditures for business travel... savings after equipment purchase could be as high as $4.5 billion." Although the realization of this potential has not been documented on a comparable scale, impressive savings have been reported. (See Olgren and Parker, 1983; Polisbuk, 1975; and Kohl, 1975.)

Efficiency on such a grand scale undoubtedly will attract many more to teleconferencing. However, the effects of switching from face-to-face to electronic communicatons obviously has many considerations beyond delivery cost savings. During a Health and Human Services Workshop on the use of telecommunications it was reported that each delivery method has specific strengths and weaknesses and should, therefore, be selectively used according to the purpose of the meeting or training and the specific situational factors involved.

The Office of Human Development Services, Administration for Children, Youth, and Families, and the Office of Program Development, in an effort to examine these considerations, jointly funded the North Carolina Office of Day Care Services (ODCS) to test the efficiency of telecommunication for training in a manner that would have definite policy implications. This goal compelled ODCS to devise field tests simulating typical training under conditions conducive to drawing meaningful inferences.

This executive summary presents comparisons of

trainees receiving selected types of training via teleconferencing (**teletraining**) to those trainees receiving traditional training. Comparisons focus on attitudes, perceptions, and knowledge gains as measured by written questionnaires and tests. Trainees represent a cross-section of North Carolina Day Care and Head Start center providers, and not a national population.

Also included in this executive summary is an analysis of the cost effectiveness of teletraining. This cost analysis presents costs for start-up, curriculum development, and training delivery for selected teletraining approaches. A discussion of various factors influencing the cost effectiveness of teleconferencing, such as distance and length of training, is also included.

Purpose of Study

The overall purpose of the study was to examine the feasibility of incorporating teletraining into a statewide staff development program and to assist other states and agencies in setting up teleconferencing training networks, if teletraining was found to be feasible.

The ODCS established four teleconference centers throughout North Carolina where Day Care and Head Start directors, teachers, and aides received training in three content areas. The training — delivered via audioconferencing enhanced with slides, with slowscan, or with video cassettes — was also delivered face-to-face; each delivery was evaluated by ODCS and a third-party. This evaluation of the training approaches was examined in four areas by asking the following evaluation questions:

Process: Are there differences among the approaches in the way in which they are implemented?

Learning: Are there differences among the approaches in the amount of knowledge acquired by trainees?

Are there characteristics of trainees which are related to the effectiveness of the approaches?

Attitudes: Are there differences among the approaches in terms of trainee perceptions and satisfaction?

Cost: Are there cost differences among the approaches?

Summary of Findings

The ODCS and third-party evaluators found the following answers to the above questions:

Process: Training can be provided consistently across a variety of teleconferencing approaches.

Learning: Teletraining can effectively be used to increase the knowledge of Day Care and Head Start teachers, aides, and administrators.

Specific demographic characteristics of the trainees do not seem to be related to the amount of learning that takes place.

Attitudes: Trainee perceptions of teletraining, in general, and of the various types of training, specifically, were positive.

Cost: Teletraining can be a cost effective alternative to traditional training, depending on the training approach used, the characteristics of the training network, the training facilities, frequency of training, the length of training, the geography and characteristics of the area served, and the manner in which training materials are developed and/or adapted.

The remainder of the executive summary covers the following aspects of the study: Research Methodology; Data Collection; Discussion of Findings on process, learning, attitudes and cost; Cost Effectiveness, Teleconferencing Benefits; and Conclusions.

Research Methodology

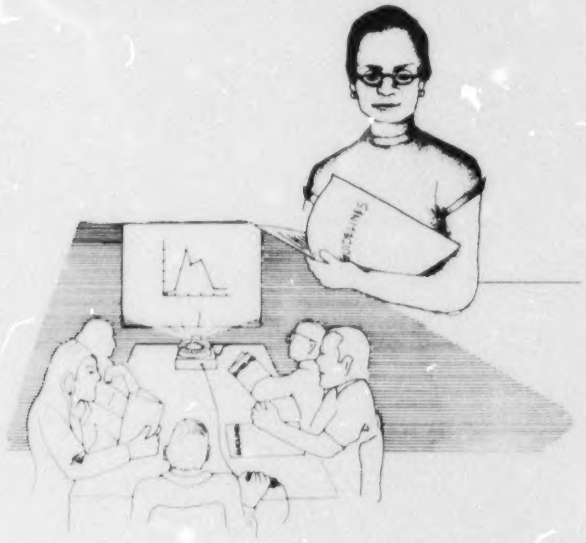
The study was designed to provide a comparison of the four training methods outlined below. Day Care and Head Start centers in which volunteer trainees worked were randomly assigned to one of the training approaches — traditional, audio enhanced with slides, audio enhanced with video and audio enhanced with slowscan for teachers and aides; and traditional, audio enhanced with slides, and audio enhanced with video for administrators. Audio enhanced with slowscan was not used with the administrators because of equipment problems. Teletraining was provided using transmission either to a single site or to two sites simultaneously.

Instruments designed and used to measure process and outcomes included:

1. an observation form for evaluators to record observations of the implementation of the training,
2. pretests and posttests to determine the knowledge trainees acquired,
3. an opinionnaire to determine trainees' opinions of and attitudes toward the overall training and toward the technologies used,
4. a demographic survey to obtain information on the characteristics of the trainees and their centers.

The ODCS Telecommunications Study tested the feasibility of the following alternative training approaches:

- *Traditional (TRAD):* Face-to-face (control group): Here, all training was presented in person at the remote teleconference centers. Trainers traveled to each of the teleconference centers and delivered training in the same content area as in the other training approaches. The audiovisual aids were the same as those typically used in traditional training.
- *Audio enhanced with slides (AUDIO):* This training required the use of the telephone lines to hook up trainers and trainees at different locations. Trainees attended a scheduled training event at the nearest teleconference center. The training originating in the Raleigh Teleconference Center was conducted by the ODCS Project staff who instructed trainees (one-way communication) and answered questions (two-way communication). A facilitator at each site assisted trainers and trainees by organizing the sessions, moderating discussions, distributing handouts, and operating audiovisual equipment.



- *Audio enhanced with video cassettes (VIDEO):* This training was identical to that above, with one major change. In this training approach, trainees watched a video cassette in lieu of slides. Interspersed with the video cassette was a (two-way) question and answer session between the trainer based in Raleigh and the trainees at the remote site.

- *Audio enhanced with slowscan (SCAN):* Slowscan teleconferencing allowed the transmission through the telephone line of still images to a video monitor approximately every 36 seconds. Images of participants, pictures, diagrams, transparencies, and printed materials were shown to trainees during training. Verbal interaction occurred over the telephone line as in an audioconference.

Other salient features of the research design were:

- *Target Population:* The training population consisted of directors and caregivers from Head-Start and State-Subsidized Day Care centers in North Carolina.

- *Teleconference Centers:* ODCS established three urban and one rural teleconference center in North Carolina at:

  New Bern—in the eastern part of the state
  Charlotte—in the piedmont section of the state
  Greensboro—in the piedmont section of the state
  Asheville—in the western part of the state.

Each teleconference center was furnished with the equipment needed to deliver the four training approaches.

- *Sampling Procedures:* The directors of participating centers were asked to select caregivers who worked with three to five year olds and who, in their judgment, could benefit from the training. Centers were randomly assigned to a training approach. One or two providers from each of these centers attended training at the teleconference center closest to them. Directors or staff with administrative responsibilities received training in a different content area from that received by teachers and aides. Attendance at each site ranged from 7 to 18 for teachers and aides and from 3 to 14 for administrators.
- *Training Content:* ODCS delivered training for teachers and aides supportive of CDA competencies in two topic areas:

  "Creating a Classroom Environment" referred to as *Environment*
  "Focus on Families" referred to as *Families*

  and one topic for center administrators

  "A Question of Money: An Introduction to Financial Management" referred to as *Money*.

The learning model used was based on instructional design and adult education principals. All training closely replicated standard Day Care and Head Start training in terms of length of session, orientation, presentation methods, the use of audiovisual materials, and participation by trainees.

- *Delivery:* Training in each of the content areas lasted between three and four hours. Trainees assembled at the teleconference centers for training delivered using the traditional approach as well as the teleconferencing approaches. When a teleconferencing approach was used, the transmission was from Raleigh to a single site or to two sites simultaneously. Trainees experiencing teleconferencing were able to interact over the audio connection with the trainer in Raleigh. When the transmission was to two sites, the trainees at one site could interact with their peers at the other site as well. Table One presents the attendance for training in the three content areas for each of the training approaches.

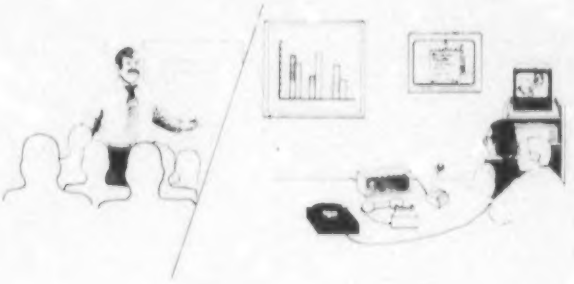


Table One
Attendance at Teleconference Centers by Content Area, and Training Approach

	Training Modality				
Content Area	**TRAD**	**AUDIO**	**VIDEO**	**SCAN**	**Total**
Environment	37	44	37	38	156
Family	35	37	33	33	138
Financial Management	35	36	38	[1]	109

See Research Methodology for definitions of TRAD, AUDIO, VIDEO, and SCAN.
[1]Omitted. Because of technical difficulties, sessions were cancelled.

Table Two
Data Collection Procedures

Evaluation Question	Variable to be Assessed	Instrument	Data Collection Procedure	Data Analysis Procedure
1. Are there differences among the approaches in the way in which they are implemented?	a) Description of the training b) Aspects which might influence or explain results	Observation Form	Observation by external evaluators at the training site and transmission site	a) Summary of Observations b) Compilation of Ratings
2. Are there differences among the approaches in the amount of knowledge gained by the trainees?	Knowledge acquisition	Knowledge Test	Pre and Post administration to trainees by external evaluator	Analysis of Variance
3. Are there differences among the approaches in terms of trainee perceptions and satisfaction?	Attitude toward and opinion regarding the training	Opinionnaire	Post only administration to trainees by external evaluator	Analysis of Variance
4. Are there characteristics of trainees which are related to the effectiveness of all the training approaches?	a) Characteristics of the center in which the trainee works	Demographic Survey	Mailed to trainees and brought to training	Correlation
5. Are there cost differences among the training approaches?	a) Start-up costs (e.g. purchase of equipment) b) Curriculum development costs (e.g. materials, staff time) c) Training delivery costs (e.g. travel, staff time)	Invoices, Contract Specifications, Staff Daily Schedule Forms	Records kept on all expenditures, time sheets maintained daily by staff	Compilation of costs and staff time

Data Collection

Data collection procedures and analyses used by the third-party and in-house evaluators are summarized in Table Two. Additional details can be found in the third-party technical evaluation report available from the Office of Day Care Services.

The following five instruments were used to record answers to the evaluation questions:

- *Observation Form:* This form was used to record observations of the training process.
- *Knowledge Tests:* These tests measured trainee knowledge of the content before and after training. Different multiple choice tests were developed for each of the three content areas. The pretest and the posttest differed in the way questions were ordered.
- *Trainee Opinionnaire:* This inventory was used to gather information on trainees' opinions of and attitudes toward the training. Both multiple choice and open-ended questions were administered after each training session. Each form contained questions generic to all training and questions unique to the training approach employed.
- *Demographic Survey:* This questionnaire obtained information on characteristics of the trainees and the centers in which they worked.
- *Staff Daily Schedule Form:* These forms recorded, on a daily basis, staff time spent on specific activities such as curriculum development, travel, etc.

Discussion of Findings

Results of the data analyses are reported below for each of the evaluation questions.

Findings on Process

Training can be provided consistently across a variety of teletraining approaches.

The way in which the training was presented was found to be consistent across all approaches — particularly in the coverage of content and procedural activities. Over 98% of the planned content was covered in all sessions and, in most, all planned procedures were carried out. Therefore, training content can be adapted to a teleconferencing format with the same consistency as to a traditional format.

While the amount of training time varied from one session to another, the most consistent trend involved audioconferencing using video cassettes with interactive audio, which took slightly more time when transmitted to multiple sites than for training transmitted to single sites. Given that these differences were 24 minutes or less, it is evident that teletraining can be conducted in equivalent amounts of time. The data in Table Three reflects the average time required for training for all approaches.

Table Three
Average Time Required for Training

	Treatment Modalitites			
Content Assessed	**TRAD**	**AUDIO**	**VIDEO**	**SCAN**
Environment				
single site		3 hrs 0 min	2 hrs 21 min	2 hrs 52 min
multiple site		2 hrs 58 min	2 hrs 45 min	2 hrs 47 min
all sites	2 hrs 43 min	3 hrs 2 min	2 hrs 34 min	2 hrs 51 min
Families				
single site		3 hrs 9 min	3 hrs 9 min	[1]
multiple site		3 hrs 19 min	3 hrs 20 min	
all sites	3 hrs 14 min	3 hrs 14 min	3 hrs 15 min	
Money				
single site		2 hrs 22 min	2 hrs 7 min	[1]
multiple site		2 hrs 24 min	2 hrs 23 min	
all sites	2 hrs 20 min	2 hrs 22 min	2 hrs 14 min	

See Research Methodology for definitions of TRAD, AUDIO, VIDEO, and SCAN.

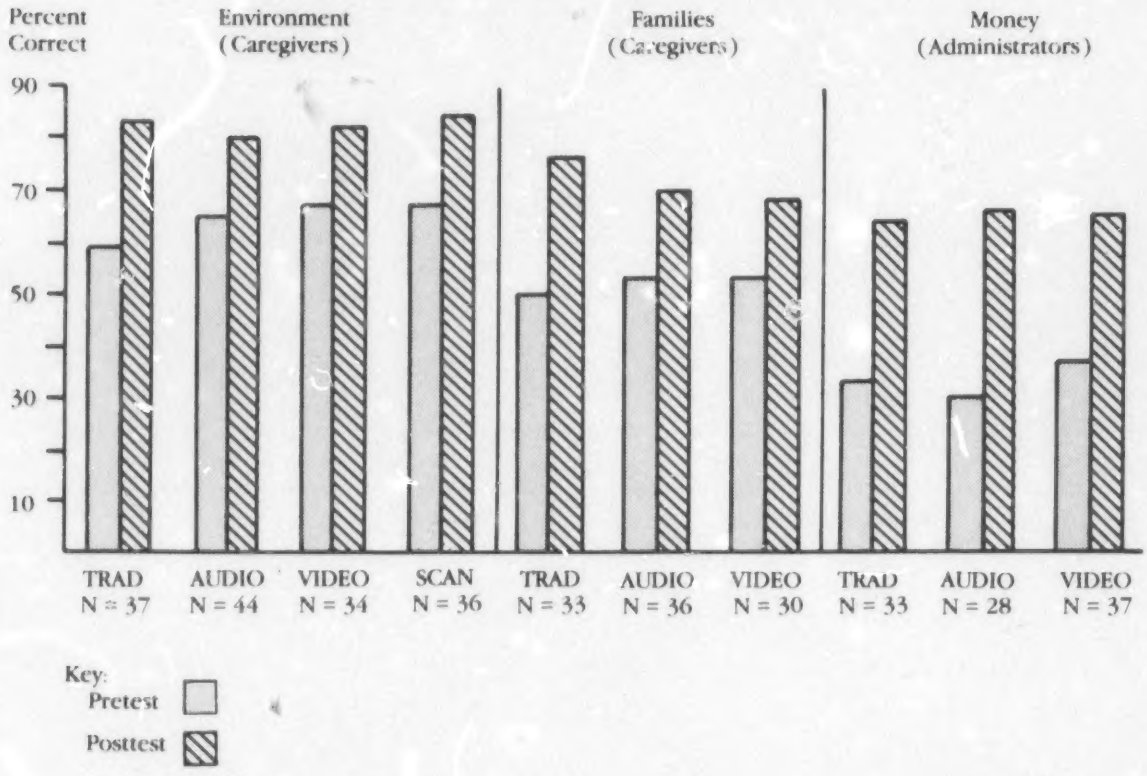
[1]Omitted. Because of technical difficulties, sessions were cancelled.

Findings on Learning

1. Teletraining can be used effectively to increase the knowledge of Day Care and Head Start teachers, aides, and administrators.

The results of this study indicate that significant gains in knowledge were experienced by the trainees in all of the training approaches used. However, there was no relationship between knowledge acquisition and the various training approaches across different content areas. While knowledge gains, for caregivers, in *Environment* and *Families* were greatest for the traditional training approach, none of these differences in knowledge gains were statistically significant. Administrators demonstrated the largest pre-post differences for the audio approach, but these differences in knowledge gains were also not statistically significant. Figure 1 reflects the knowledge acquisition of trainees from pretest to posttest. Further statistical analyses of the data presented in Figure 1 indicated that there were no significant differences in knowledge acquisition when teletraining was delivered to one site or to two sites simultaneously.

Figure 1
Knowledge Acquisition
(Percentage of Correct Responses on Pretests and Posttests)



2. Specific demographic characteristics of the trainees do not seem to be related to the amount of learning that takes place.

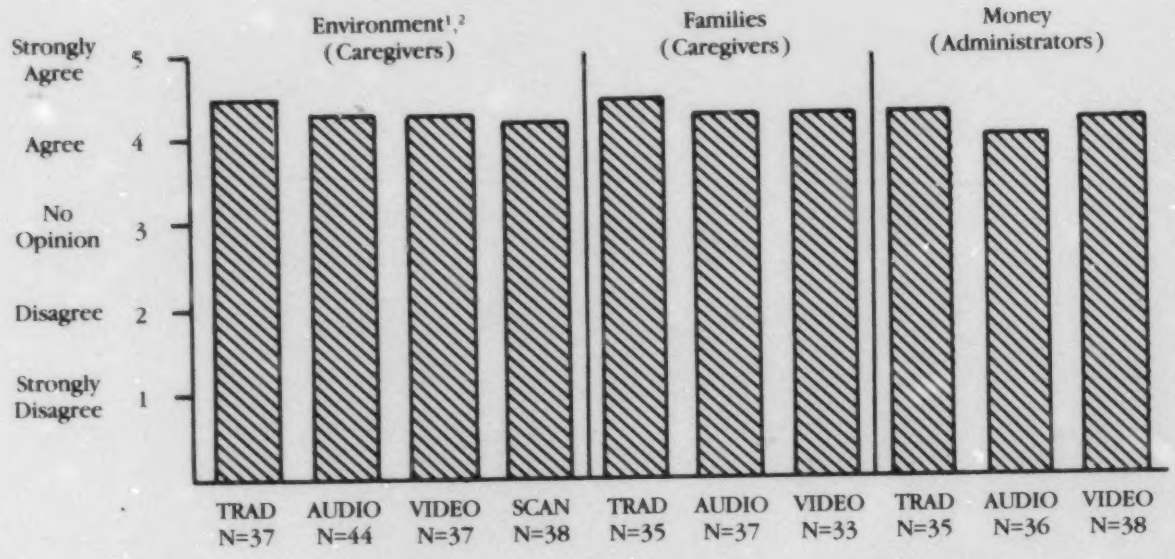
Demographic characteristics of those trainees who gained the most knowledge as a result of the training were compared to the characteristics of the remainder of the trainees. While there was some variation between the two groups, none of the comparisons appeared to be strong enough to identify additional characteristics that should be considered in selecting trainees for teletraining.

Findings on Attitudes

1. Trainee perceptions of the various training approaches were positive.

An analysis of the trainees' perceptions of the overall training indicated a generally positive attitude toward the training, regardless of approach. Trainee perceptions of the various training approaches are presented in Figure 2. When ratings and comments on teletraining were compared, there were no statistically significant differences among the various training approaches used in this study with the exception of caregivers in the traditional group. This group perceived traditional training more positively than trainees in the slowscan group. Also, administrators in the traditional training group were slightly more positive in how they assessed training in financial management than were those receiving audio and video training. However, these differences were not statistically significant.

Figure 2
Trainee Satisfaction with Overall Training
(Average Likert Ratings)



[1]Environment was the only topic presented using slowscan.
[2]The ratings for traditional training were statistically, significantly higher than those for slowscan.

2. Trainees rated teletraining sessions transmitted to a single site more positively than they viewed teletraining transmitted to multiple sites.

Teletraining transmitted to a single site was compared to the training sessions simultaneously transmitted to two sites. Teletraining transmitted to a single site was viewed more positively by the administrators than the same type of training simultaneously transmitted to two sites. Administrators from the multiple site session complained about timing and pacing factors. There were no significant differences between the sessions for caregiver groups. Trainee ratings of single site and multiple site transmissions are presented in Figure 3.

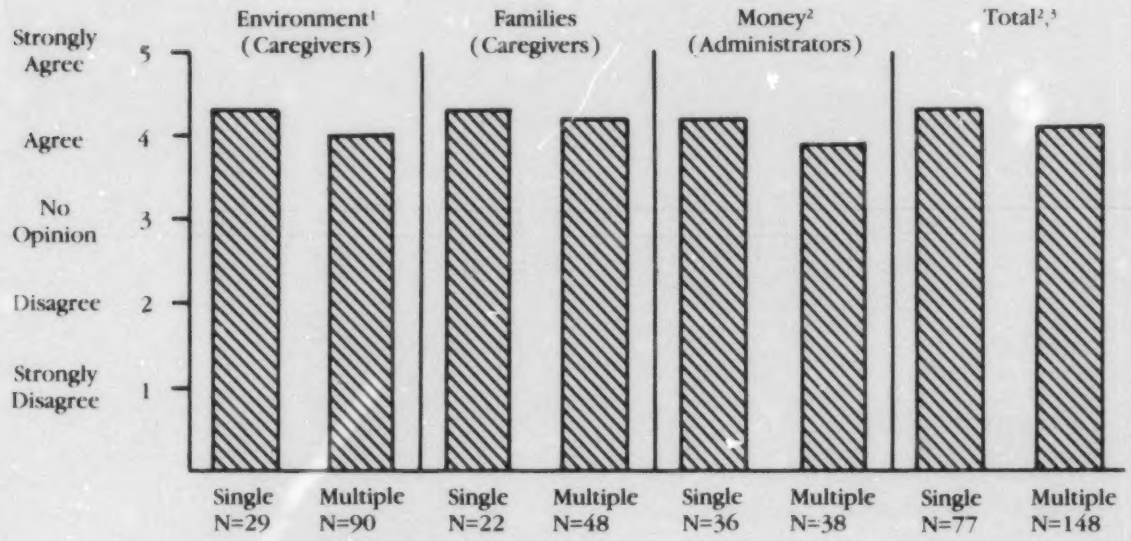
Findings on Cost

Costs of the Project fell into three categories: (1) start-up, (2) curriculum development, and (3) curriculum delivery.

- *Start-Up Costs:* The cost of purchasing equipment necessary to deliver all three training approaches was $12,218 per site. The cost of the equipment would have been: $1200 for audio enhanced with slides only, $2974 for audio with video only, and $10,044 for audio with slowscan only. In addition to the $12,218 for purchasing of equipment the Office of Day Care Services paid an additional $8,113 for site selection, installation, maintenance, and testing of equipment; for training technicians to operate the equipment; and for fees paid to consultants on the use of the equipment for teletraining.

  The start-up costs for future teleconferencing projects need not be as high as that incurred by ODCS. The research design of the study mandated that each site be capable of delivering training by all three teleconferencing approaches. An audio only or an audio with video cassette capability may well suffice for most agencies. Expensive consultation fees can be avoided by consulting

Figure 3
Trainee Satisfaction with Single Site and Multiple Site Transmissions
(Average Likert Ratings)



[1]Environment was the only topic presented using slowscan.

[2]The ratings for those attending single site transmissions were statistically, significantly higher than those for trainees attending sessions in which training was transmitted to multiple sites.

[3]Ratings from the slowscan sessions on Environment were excluded from this analysis.

with those in the health and human services field experienced in the art of teletraining. Improvements in the technology and competition among manufacturers and vendors may reduce equipment costs. Finally, potentially less costly equipment arrangements, such as leasing or renting rather than purchasing can be made.

- *Curriculum Development Costs:* Curriculum development costs are one-time-only expenditures. Costs for each of the three content areas included costs for developing the content, designing the instruction, and producing the materials. Because this project was research-oriented, curriculum development costs for all training approaches were much higher than for a project with a non-research emphasis.

  Average curriculum development costs across content areas were higher when the training approach used was audio with videocassette ($5,700), followed by audio with slowscan ($2,687), and audio with slides ($2,584), and traditional ($1,975). The relatively high audio with video cassette development costs resulted from expenses incurred in the production of video cassette tapes.

- *Delivery Costs:* The average cost for delivering training using audio and audio with video cassettes was lowest ($145), followed by traditional training ($202) and highest for slowscan ($274). Delivery of traditional training included travel cost (.18 per mile) per diem expense ($42 per day when overnight stays occurred) and trainer salary for time spent training and traveling ($14.23 per hour). Tables Four and Five present these delivery costs.

Table Four
Average Delivery Costs for All Training Approaches[1]

Training Approach	Average Cost
TRAD	$202
AUDIO	145
VIDEO	145
SCAN	274

See Research Methodology for definitions of TRAD, AUDIO, VIDEO, and SCAN.

[1]Delivery from the central training site in Raleigh to selected remote sites.

Table Five
Delivery Costs for
Traditional Training at Selected Sites

Site	Round Trip Miles	Car Costs[1]	Per Diem[2]	Staff Costs[3]	Total
Greensboro	156	$28	—	$ 95	$121
New Bern	224	40	—	113	153
Charlotte	286	51	42	128	221
Asheville	482	87	42	185	314
Average	287	$52	$21	$130	$202

[1]Car costs are $.18 per mile.

[2]Normally, per diem costs are incurred for round trips over 200 miles; however, the trainer had to return to Raleigh to deliver training via a teleconferencing method the next day.

[3]Staff costs are based on the trainer's salary of $14.23 per hour; traveling speed averaged 50 mph.

Cost Effectiveness

The following discussion of cost effectiveness is based on the findings of our research and our applications of teletraining for Day Care and Head Start staff.

Caregivers and administrators acquired the same level of knowledge through teletraining as they did through traditional training. Their attitudes toward training were also essentially the same regardless of which training approach was used. Moreover, teletraining can be a cost effective alternative to traditional training with some teletraining approaches more cost effective than others. The ODCS study identified the following factors that are related to the cost effectiveness of teleconferencing as a training approach.

- *Frequency with which Training Content is to be Delivered:* Since developmental costs tend to be higher for teletraining and delivery costs tend to be higher for traditional training, it stands to reason that teleconferencing is most appealing when a specific training content is to be delivered frequently and development and delivery costs can be recouped over the course of the delivery period of the particular training program.
- *Selecting a Teleconferencing Technology:* In this study, only audioconferencing was found to be consistently cost effective, while other training approaches were cost effective when travel was great. However, a decision as to which teleconferencing technology to select goes beyond cost considerations. For example, to accomplish the goals of the training event it may be important that the trainees and trainer be able to see each other. As another example, it may be that information requiring the use of numerous graphics frequently needs to be dispersed to the field immediately and usually there is insufficient time to mail them. Slowscan conferencing might suffice in either of these situations. As a third example, a library of training materials already in existence in the form of video cassette tapes may warrant selecting audio enhanced with video.
- *Developing Content:* Development costs need not be high. Experienced teleconferencing trainers may produce content inexpensively, or adapt existing materials to teleconferencing approaches.

- *Location of Teleconference Centers:* Cost benefits are maximum for those teleconference centers located in densely-populated areas far away from the usual transmission point.
- *Length of Training:* The length of the training session had a complex relationship to cost. ODCS paid a fixed, hourly rate for the use of each teleconference center and the telephone lines. The longer the teleconference session, the more expensive — a fact mitigating against long teleconference training sessions at locations close to the transmission site. However, long traditional training sessions may require expensive overnight stays for the trainer and trainees and, thus, costs may increase considerably.
- *Multiple Site Training:* Teleconference training is most cost effective when transmitted simultaneously to multiple sites. Such training requires the use of a bridge that links the multiple sites in such a way as to allow multidirectional flow of communication. Bridges are often purchased or leased by large training programs. Small training programs can access a bridging service on an hourly fee basis.

Based on the above factors, the most cost effective model of teleconferencing would be training using audioconferencing at a center some distance from the transmission point. Simultaneous transmission to multiple sites would further increase the cost effectiveness of this model.

Teleconferencing Benefits

In addition to the findings based on hard data, a number of tangible and intangible benefits were derived from teletraining. Some general benefits of teleconferencing followed by some specific benefits to the agency, conference leaders and trainers, and trainees are listed below.

- Increases staff productivity
- Increases access to remote locations
- Improves communication processes
- Promotes use of efficient training systems
- Facilitates efficient and consistent policy discussions
- Provides greater access to outside experts
- Broadens agency's scope
- Decreases wasted time due to travel
- Reduces travel and expense budget
- Enhances organization's professional image

Benefits to the Agency

- Increases staff productivity by reducing travel time.
- Facilitates decision-making and problem-solving by enabling administrative issues to be handled expeditiously.
- Allows policy issues to be simultaneously discussed and standardized across entire geographic or service regions.
- Increases agency's scope allowing it to reach remote areas and to communicate with agencies and organizations across the nation.
- Increases accessibility to outside experts. Because meetings can be held using telephone lines, experts previously inaccessible, either due to travel constraints or schedules, are now more accessible.

Benefits to Conference Leaders and Trainers

- Decreases travel time. As the leader or trainer uses teleconferencing for training and meetings, on-the-job time increases.

- Makes experts more accessible. When teleconferencing, the expert speaker is as near as the telephone; thereby, broadening the trainer's resources for guest speakers.
- Allows teleconferences to take place even when situations such as transportation problems arise that may prevent the leader or trainer from leaving home.
- Provides opportunity to use new technology. A conference leader or trainer will become familiar with the technology currently being used and will stay abreast of the communication technologies.

Benefits to Trainees

- Increases accessibility to training. Trainees with commitments close to home, handicapped individuals for whom travel is difficult, and those in areas affected by adverse weather will be able to participate in training more readily.
- Provides more opportunities for attending training because expenses are reduced.
- Makes more content experts available to trainees.
- Allows for more individualized training.
- Provides opportunity to use new technology and up-to-date training techniques.

Conclusion

Our conclusion from this study is that the effectiveness of teleconferencing ultimately rests upon use. These instructional technologies offer many benefits; however, they may become little more than "capital-intensive and labor-intensive toys" unless careful consideration is first given to the problems they are to solve. Agency administrators at the state and national level have a critical role to play in introducing and promoting the use of teleconferencing in human services agencies and must pay attention to the human as well as technical factors involved in preparing staff to use these new technologies (See Benson, 1984). The more frequently a teleconferencing system is used, the quicker the investment and development costs will be recovered. The use need not be limited to training. Teleconferencing represents an efficient and effective alternative to a variety of face-to-face meetings, when traveling is considerable, time is of the essence, and need is extensive.

The findings produced by and our knowledge and experience derived from conducting the study indicate that additional research, demonstration, and evaluation is needed in the following areas:

- Guidelines for the types of teleconferencing equipment appropriate for human services agencies should be developed to assure sharing of resources and materials and to assure compatibility of systems developed in the future.
- Systematic approaches to generating cost information on agency teleconferencing systems is critical. Currently, there is not a standard approach to costing out teleconferencing system usage; therefore, it is difficult to make comparisons between different delivery systems.
- The use of teleconferencing can be encouraged by continuing to make its proposed use an evaluation criterion for new proposals.
- States should be encouraged to report their efforts and results in the application of teleconferencing so that an information data base for new users can be developed.
- Criteria for the selection of appropriate teleconferencing technology to meet specific needs should be established. The technology changes rapidly; however, selections should be based not only on current intended use, but also on potential long range applications.
- Informal networking among teleconferencing users for the purpose of sharing training resources readily adapted to teleconferencing should be encouraged.

The following suggestions can help human services agencies make a meaningful application of teleconferencing . . . a high-tech solution to many training delivery problems.

- Human services agencies need to have a receptive attitude to doing things differently in order to be prepared to use changing technologies such as teleconferencing systems for training.
- Monies should be reallocated to finance teleconferencing systems.
- Cooperative agreements with other public agencies and the private sector should be explored as a means to help finance funding for teleconferencing systems.

- Agencies should develop networks to promote the sharing of well-designed curricula and audio-visual aids.
- Agency administrators should help market the use of teleconferencing by building in reinforcements for its use and promotional campaigns that outline benefits to users.

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